

Unstable angina

The problem of definition

Robert A. Chahine

From the Department of Medicine, Baylor College of Medicine, and the Veterans Administration Hospital, Houston, Texas, U.S.A.

Unstable angina is used interchangeably with a variety of other terms to refer to a clinical situation intermediate in severity between chronic effort angina and myocardial infarction. In most reports dealing with this syndrome, the patients were selected according to a number of criteria which varied from one study to another. Some authors recognized subgroups of patients with variable severity while others looked at unstable angina as one single group. This resulted in conflicting observations and consequent dilemmas in the management of these patients.

Accurate definitions are, therefore, necessary. It is proposed to divide unstable angina into two main clinical categories. Type I: This includes three subgroups. (A) Patients with known chronic angina and sudden or accelerated progression of symptoms; (B) patients with chronic angina and onset of recurrent attacks at rest; and (C) patients with angina of recent onset and rapid progression into a severe condition. Type II: (severe unstable angina). Any of the subgroups described under unstable angina Type I will qualify for this classification if the patient develops recurrent episodes of prolonged ischaemic chest pains resistant to nitroglycerin lasting for 15 minutes or more. Accurate measurement of symptoms and laboratory criteria are suggested to qualify for the different subgroups of unstable angina.

The problem

Unstable angina is gradually becoming the most popular term to refer to that clinical situation intermediate in severity between chronic effort angina and myocardial infarction. A variety of terms has been used over the years to refer to the same syndrome: preinfarction angina, impending myocardial infarction, acute coronary insufficiency, coronary failure, status anginosus, crescendo angina, and intermediate coronary syndrome (Freedberg *et al.*, 1948; Graybiel, 1955; Master *et al.*, 1956; Papp and Smith, 1960; Beamish and Storrie, 1960; Resnik, 1962). It commonly occurs in medicine that the less known about a disease state, the more names are given to it. Does the trend to use 'unstable angina' as a replacement for all the above reflect a significant improvement in our understanding of this condition?

Authors interested in this syndrome have long recognized the problem of the semantics. Regardless of the term they selected, they have tried to define their patients according to a set of criteria (Gazes

et al., 1973; Miller *et al.*, 1973; Conti *et al.*, 1973; Fischl, Herman and Gorlin, 1973). These included some or all of the following: (1) a change in the character of the chest pain, usually involving an increase in severity and/or frequency; (2) occurrence of angina at rest; (3) recent onset of angina; (4) occurrence of an episode of prolonged chest pain that results in admission to the coronary care unit to rule out myocardial infarction; (5) occurrence of recurrent prolonged episodes of chest pain lasting more than 15 or 20 minutes; (6) angina, resistant or incompletely relieved by nitroglycerin; (7) absence of any evidence of precipitating factors for the change in the anginal pattern; (8) documentation of electrocardiographic ST-T abnormalities suggestive of ischaemia, concomitant with the chest pain; (9) documentation of absence of serum enzyme increase to levels indicative of myocardial infarction; and (10) demonstration of 'critical lesions' (more than 70% luminal narrowing) in at least one major coronary artery.

The population of patients with this syndrome has varied from one study to another, depending on the set of criteria required for qualification. Some

investigators subdivided their patients into several subgroups using personalized sets of criteria for each subgroup (Gazes *et al.*, 1973; Bertolasi *et al.*, 1974). Consequently, the presently available information relates to a wide spectrum of cases, yielding conflicting and paradoxical findings leading to controversy and uncertainty about the management of this syndrome. For example, the rate of progression to myocardial infarction varied from 13 per cent within one year (Krauss, Hutter, and DeSanctis, 1972) to 41 per cent within 3 months (Vakil, 1964). Mortality of patients treated medically varied between 5 per cent in 8 months in one subgroup (Bertolasi *et al.*, 1974) and 43 per cent in one year (Gazes *et al.*, 1973) in another subgroup. Surgical mortality also varied between 0 (Auer *et al.*, 1971) and 22 per cent (Conti *et al.*, 1973).

There is no question that these apparent discrepancies are, at least in part, related to the problem of semantics and definitions. It may be advisable to select one general term to refer to this syndrome. The trend seems justifiably to be in the direction of the term 'unstable angina'. However, it is crucial to define accurately the various subgroups that could be included under this term.

Why is unstable angina a better term than the others? Preinfarction angina and impending myocardial infarction are somehow misleading because it is well established that only a relatively small percentage of patients presenting with the various forms of this syndrome progresses to myocardial infarction. Coronary failure and acute coronary insufficiency are also inappropriate because they do not distinguish between this syndrome, stable angina, and myocardial infarction where coronary insufficiency may be the basic pathophysiology. Status anginosus seems to imply persistent continuous anginal pain, rather than recurrent episodes and, therefore, does not describe the usual presentation of these patients. Crescendo angina may describe a subgroup of the unstable angina population but would not apply to the majority because a crescendo pattern is not always present. The intermediate coronary syndrome is a reasonably good term though not entirely self-explanatory; however, unstable angina is more descriptive and, in view of its current popularity, might be a better choice.

The term 'unstable angina' has two important disadvantages. First, some may take it literally and might be tempted to include all angina of recent onset including the mild or moderate effort angina under this terminology, on the basis that these patients now have angina which they did not have three months ago, therefore they are unstable.

Second, the term is too broad and may encompass a wide spectrum of situations that may vary in their clinical presentations and may differ in prognosis. A stratification of the conditions that are included under 'unstable angina' is, therefore, necessary.

Suggested solution

A good approach would be to divide unstable angina into two main categories—type I and type II.

Type I Unstable angina

This includes three subgroups:

(A) Patients with known angina pectoris of 3 months' duration or more, who develop sudden or accelerated progression of their symptoms, in severity and/or frequency, within 8 weeks of the time of evaluation. The progression of symptoms should be spontaneous and not attributable solely to a transient physical or emotional strain.

(B) Patients with known effort angina of 3 months' duration or more who develop recurrent resting angina within 8 weeks of time of evaluation.

(C) Patients with angina of recent onset, within 8 weeks of the time of evaluation, who progress rapidly into a severe condition where pain is produced by less than ordinary activity or who develop recurrent attacks at rest. Subjects with recent onset of mild or moderate exertional angina should not be included here.

Documentation of ischaemic electrocardiographic changes accompanying the chest pains in either of these subgroups is highly desirable when feasible.

Type II Unstable angina (severe unstable angina)

Any of the subgroups described under unstable angina type I (A, B, or C) will qualify for this classification if the patient develops recurrent episodes of prolonged chest pain, resistant or incompletely relieved by nitroglycerin, lasting for 15 minutes or more. At least one episode of chest pain occurring within one week of the time of evaluation should have lasted 15 minutes or more; other episodes do not necessarily have to be prolonged if they occur at rest. Documentation of ST depression of 1 mm or more or T wave inversion during at least one episode of prolonged chest pain is mandatory to confirm its myocardial ischaemic basis. Serial electrocardiograms and enzymes should exclude the possibility of myocardial in-

farction. The electrocardiographic changes should be transient and not persist beyond 36 hours. The enzymes (serum aspartate aminotransferase, creatine kinase, and lactic dehydrogenase) should remain below the level that would be considered compatible with myocardial infarction.

Patients with one single episode of prolonged ischaemic chest pain are difficult to place in this classification. They may have a somewhat better prognosis than those with recurrent episodes (Krauss *et al.*, 1972). Some cardiologists believe that these may represent small subendocardial infarcts that do not result in enough electrocardiographic and enzymatic change to become clearly evident. These patients should, therefore, not be included under type II unstable angina and may have to be considered as a separate group. Whether or not to label them as unstable angina (possibly type 3) may have to await the development of further diagnostic techniques that can detect smaller infarcts.

If this nomenclature is accepted, practically every patient presenting with the syndrome of intermediate severity between stable effort angina and myocardial infarction should qualify for one or the other of the subgroups defined. This should consequently result in separation of the 'mild' unstable angina from the 'severe syndromes' which may have a different prognosis.

Discussion

Why is there the current interest in unstable angina? In a recent study on the prodromata of acute myocardial infarction, it was noted that about 60 per cent of the patients presenting with acute myocardial infarction, gave histories of symptoms reminiscent of 'unstable angina' within 8 weeks of the infarction (Solomon, Edwards, and Killip, 1969). If these patients could be identified before the onset of necrosis and appropriate management instituted, it is conceivable that mortality from coronary heart disease might be further reduced. On the other hand, regardless of the criteria used in the selection of patients, it is now generally agreed that 'unstable angina' has a more serious prognosis and higher mortality than the stable phases of the disease.

Why subdivide the patients with 'unstable angina' into different subgroups? Many authors have long recognized that the syndrome of intermediate severity between stable effort angina and myocardial infarction included patients with variable clinical presentation and different prognosis. Resnik (1962) divided his cases of 'pre-infarction angina' into those with known predisposing factors

and those with no apparent precipitating cause, and stressed the prognostic implications of the clinical presentation. Krauss *et al.* (1972) recognized that in their patients with 'acute coronary insufficiency' those who had recurrent episodes of prolonged chest pain had a more serious prognosis; also patients with recent onset of angina had a more favourable prognosis when compared to those with a history of previous stable angina. Gazes *et al.* (1973) divided their patients into a high risk group and a lower risk group and recognized specific clinical criteria which differentiated between these two groups. Bertolasi *et al.* (1974) divided their patients of unstable angina into one group that they categorized as 'intermediate coronary syndrome' who had recurrent episodes of prolonged chest pain, another group they labelled 'progressive angina' where worsening of symptoms occurred in patients with stable angina, and a third group they referred to as 'post-myocardial infarction angina'. These authors also described a significant difference in the prognosis and therapeutic results between these subgroups. It is, therefore, clear that 'unstable angina' encompasses patients with syndromes of varying severity and prognosis. Any study oriented at assessment of therapeutic results in this condition should take this point into consideration. Results from available studies may not be comparable because of the lack of homogeneity in the criteria used to select and group patients.

The need for evaluation of results of therapy of 'unstable angina' (medical versus surgical) in comparable groups of patients selected on the basis of similar criteria and distributed randomly to each modality of treatment has been recognized (Conti *et al.*, 1975). However, in this co-operative study, all patients are included under one heading and no attempt is made to stratify patients into the 'milder' versus the 'more severe' varieties of this syndrome. Preliminary results from this study have recently been presented in the Scientific Sessions of the American College of Cardiology and showed better symptomatic improvement in the surgical patients, no difference in the mortality rate, and a higher incidence of myocardial infarction in the surgical than in the medical groups. However, these results were aggressively challenged by eminent members of the audience who objected to the randomization of patients with unstable angina as a single group, because of the possibility of more or less of the milder syndromes falling into one or the other therapeutic group. This should focus our attention on the urgent need for accurate definitions and groupings of the patients with 'unstable angina'. Clearly this problem must be settled first and should precede randomized studies

aimed at assessing the different treatment modalities.

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Requests for reprints to Dr. Robert A. Chahine, Chief of Cardiology, Veterans Administration Hospital, 2002 Holcombe Boulevard, Houston, Texas 77211, U.S.A.